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09/846,607	04/30/2001	Gerard Harbers	PHNL 000222	4771

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EXAMINER	
XIAO, KE	

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/846,607	HARBERS ET AL.	
	Examiner	Art Unit	
	Ke Xiao	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7 and 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uehara (US 4,772,885) in view of the applicant's admitted prior art (AAPA) and Yoshihara (US 6,155,016).

Regarding independent **Claim 1**, Uehara teaches an assembly comprising:

a display device provided with a pattern of pixels associated with color filters (Uehara, Fig. 3 element 63), and

an illumination system for illuminating the display device (Uehara, Fig. 3 element 43 and 51),

said illumination system comprising a light emitting panel and at least one light source, the light source being associated with the light-emitting panel (Uehara, Fig. 3 element 43 and 41),

the light source comprising at least three light emitting elements having different light-emission wavelengths (Uehara, Fig. 3 elements 43a, 43b, 43c),

the light-emitting elements being associated with the color filters (Uehara, Fig. 3 elements 43 and 63),

Uehara fails to teach wherein the light emitting elements are light emitting diodes. The applicant's admitted prior art teaches that light emitting diodes are a well-known subset of electroluminescent devices and are also well known to be used in LCD backlights (AAPA, Pg. 1 paragraph [0010]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the LED backlights as taught by the AAPA in place of the generic electroluminescent backlights as taught by Uehara in order to increase the life span of the backlight (AAPA, Pg. 1 paragraph [0010]).

Uehara as modified by the AAPA fails to teach that the illumination system is operable to drive the at least three light-emitting diodes to separately control the intensity of light emitted as claimed. Yoshihara teaches an LED illumination system operable to drive three light emitting diodes to separately control the intensity of light emitted in at least one of the different light emission wavelengths and thereby change a color temperature and illumination level of a picture to be displayed by the display devices, wherein an intensity of the light emitted by the light-emitting diodes varies in response to an illumination level of the picture to be displayed by the display device (Yoshihara, Col. 2 lines 10-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the intensity control as taught by Yoshihara in the backlight system of Uehara as modified by the AAPA in order to allow for better white light reproduction.

Uehara's preferred embodiment fails to teach that the pattern of pixels are positioned between the color filters and the light emitting panel (Uehara, Figs. 3-5). However Uehara teaches in a later embodiment that it is an obvious modification to

position the color filters on the top plate instead of with the light emitting panel thereby the pattern of pixels are positioned between the color filters and the light emitting panel (Uehara, Figs. 13-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to have position the color filters as taught secondary embodiment of Uehara in the primary embodiment of Uehara in order to create clearer pictures because the color filters are located closer to the pattern of pixels (Uehara, Col. 9 lines 45-63).

Regarding independent **Claim 13**, Uehara teaches a display device for use with an illumination system (Uehara, Fig. 3), comprising:

a liquid crystal display panel comprising a plurality of liquid crystal elements operable to selectively allow passage of light from the illumination system (Uehara, Fig. 3 element 19 and 21); and

at least one color filter operable to filter the light allowed to pass through one or more of the liquid crystal elements to produce one or more pictures (Uehara, Fig. 3 element 63);

wherein the illumination system drives at least three electroluminescent light sources having different light-emission wavelengths (Uehara, Fig. 3, 43a, 43b, 43c).

Uehara fails to teach wherein the light sources are light emitting diodes. The applicant's admitted prior art teaches that light emitting diodes are a well-known subset of electroluminescent devices and are also used in LCD backlights (AAPA, Pg. 1 paragraph [0010]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the LED backlights as taught by the AAPA in place of the

generic electroluminescent backlights as taught by Uehara in order to increase the life span of the backlight (AAPA, Pg. 1 paragraph [0010]).

Uehara as modified by the AAPA fails to teach that the illumination system is operable to drive the at least three light-emitting diodes to separately control the intensity of light emitted as claimed. Yoshihara teaches an LED illumination system operable to drive three light emitting diodes to separately control the intensity of light emitted in at least one of the different light emission wavelengths and thereby change a color temperature and illumination level of a picture to be displayed by the display devices, wherein an intensity of the light emitted by the light-emitting diodes varies in response to an illumination level of the picture to be displayed by the display device (Yoshihara, Col. 2 lines 10-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the intensity control as taught by Yoshihara in the backlight system of Uehara as modified by the AAPA in order to allow for better white light reproduction.

Uehara's preferred embodiment fails to teach that the liquid crystal display panel is positioned between the at least one color filter and the light emitting diodes (Uehara, Figs. 3-5). However Uehara teaches in a later embodiment that it is an obvious modification to position the color filters on the top plate instead of with the light emitting panel thereby the liquid crystal display panel is positioned between the color filters and the light emitting diodes (Uehara, Figs. 13-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to have positioned the color filters as taught secondary embodiment of Uehara in the primary embodiment of Uehara in order

to create clearer pictures because the color filters would be located closer to the pattern of pixels (Uehara, Col. 9 lines 45-63).

Regarding **Claim 14**, Uehara teaches an illumination system for use with a display device (Uehara, Fig. 3), comprising:

a light-emitting panel (Uehara, Fig. 3 element 21);

at least one light source associated with the light-emitting panel, the at least one light source comprising at least three light emitting elements having different light emission wavelengths, the light-emitting elements associated with color filters in the display device (Uehara, Fig. 3 elements 43 and 63); and

Uehara fails to teach wherein the light sources are light emitting diodes. The applicant's admitted prior art teaches that light emitting diodes are a well-known subset of electroluminescent devices and are also used in LCD backlights (AAPA, Pg. 1 paragraph [0010]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the LED backlights as taught by the AAPA in place of the generic electroluminescent backlights as taught by Uehara in order to increase the life span of the backlight (AAPA, Pg. 1 paragraph [0010]).

Uehara as modified by the AAPA fails to teach that the illumination system further comprises a controller operable to drive the at least three light-emitting diodes to separately control the intensity of light emitted as claimed. Yoshihara teaches an LED illumination system with a controller operable to drive three light emitting diodes to separately control the intensity of light emitted in at least one of the different light emission wavelengths and thereby change a color temperature and illumination level of

a picture to be displayed by the display devices, wherein an intensity of the light emitted by the light-emitting diodes varies in response to an illumination level of the picture to be displayed by the display device (Yoshihara, Col. 2 lines 10-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the intensity control as taught by Yoshihara in the backlight system of Uehara as modified by the AAPA in order to allow for better white light reproduction.

Uehara's preferred embodiment fails to teach that the liquid crystal display panel operable to selectively allow passage of light from the at least one light source is positioned between the one color filters and the at least one light source (Uehara, Figs. 3-5). However Uehara teaches in a later embodiment that it is an obvious modification to position the color filters on the top plate instead of with the light emitting panel thereby the liquid crystal display panel is positioned between the color filters and the light emitting diodes (Uehara, Figs. 13-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to have positioned the color filters as taught secondary embodiment of Uehara in the primary embodiment of Uehara in order to create clearer pictures because the color filters would be located closer to the pattern of pixels (Uehara, Col. 9 lines 45-63).

Regarding **Claim 2**, Uehara as modified by the AAPA and Yoshihara further teaches that the light source comprises three light-emitting diodes having different light-emitting wave lengths (Uehara, Fig. 3 elements 43a, 43b, 43c), and

the color filter comprises three color filters (Uehara, Fig. 3, 63a, 63b, 63c),

a spectral emission of each one of the three light-emitting diodes being substantially adapted to a spectrum of one of the color filters (Uehara, Fig. 3 elements 43 and 63).

Regarding **Claim 3**, Uehara as modified by the AAPA and Yoshihara further teaches he light source comprises at least one blue light-emitting diode, at least one green light-emitting diode and at least one red light-emitting diode (Uehara, Fig. 4 elements 43a, 43b, 43c),

the color filter comprises a blue, a green and a red color filter (Uehara, Fig. 4 elements 63a, 63b, 63c), and

in operation, the blue color filter predominantly passes light originating from the blue light emitting diode, the green color filter predominantly passes light originating from the green light emitting diode, the red color filter predominantly passes light originating from the red light emitting diode (Uehara, Fig. 4 elements 43 and 63).

Regarding **Claim 4**, Uehara as modified by the AAPA and Yoshihara further teaches that at least one of the light-emitting diodes is chosen such that the wavelength associated with a spectral maximum of the light-emitting diodes corresponds to a wavelength associated with a spectral maximum of the corresponding color filter in the visible spectrum (Uehara, RGB light sources to RGB filters).

Regarding **Claim 5**, Uehara in view of the AAPA and Yoshihara further teaches that the wavelength lamda.ledmax associated with the spectral maximum of at least one of the light-emitting diodes and the wavelength lamda.cfmax associated with the spectral maximum of the corresponding color filter meet the relation: | lamda.ledmax -

lamda.cfmax | <=5nm (Uehara, Figs. 7 and 8 clearly show that the wavelength of the diode and the corresponding filter match which satisfies the claimed limitation).

Regarding **Claim 6 and 7**, Uehara in view of the AAPA and Yoshihara further teaches that LEDs used for backlight often have spectral bandwidth in the range between 15nm <= FWHM <= 30nm (AAPA, Pg. 3 paragraphs [0036-0037]).

Regarding **Claim 9**, Uehara in view of the AAPA and Yoshihara further teaches that the intensity of the light emitted by the light-emitting diodes can be adjusted on a frame-to-frame basis (Yoshihara, Fig. 4, Col. 6 lines 20-52, specifically the intensity can be adjusted from frame to frame because the image being displayed can change from frame to frame).

Regarding **Claim 10**, Uehara in view of the AAPA and Yoshihara further teaches that the intensity of the light emitted by the light-emitting diodes can be adjusted for each color on a frame-to-frame basis (Yoshihara, Fig. 4, Col. 6 lines 20-52).

Regarding **Claim 11**, Uehara in view of the AAPA and Yoshihara further teaches that the each of the light emitting diodes has a luminous flux of at least five lumens (AAPA, Pg. 4 paragraph [0046]).

Regarding **Claim 12**, Uehara in view of the AAPA and Yoshihara fails to teach that the light emitting diodes are mounted on a printed circuit board. The examiner takes official notice that mounting LEDs on PCBs is well known in the backlight display art. It would have been obvious to one of ordinary skill in the art at the time of the invention to mount the LEDs of Uehara on a PCB instead of the generic plate and electrode setup in order to simplify manufacturing and increase reliability.

Regarding **Claims 15-17, 19 and 20**, Uehara fails to teach that the picture to be displayed by the display device is associated with one of a plurality of emission standards, each emission standard associated with a standardized color triangle; and

The illumination system is operable to tune the light emitting diodes such that the display device displays the picture in accordance with the standardized color triangle of the emission standard associated with the picture.

The AAPA teaches that it is well known in the art that pictures being displayed are associated with a plurality of international emission standards such as NTSC, EBU and HDTV, which are inherently associated with a standardized color triangle (AAPA, Pg. 2 paragraphs [0019-0021]). Since the illumination system of Uehara as modified above is capable of adjusting the white balance of the illumination, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the illumination system of Uehara as modified above to be operable to tune the light emitting diodes such that the display device displays the picture in accordance with the standardized color triangle of the emission standard, such as NTSC, EBU and HDTV, associated with the picture, in order to provide white balancing for a wide variety of international standards and thereby expand the usability of the display.

Regarding **Claim 18**, Uehara in view of the AAPA and Yoshihara further teaches that at least one color filter comprises blue, green, and red color filters (Uehara, Figs. 3-4 elements 63a-63c).

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uehara (US 4,772,885) in view of the applicant's admitted prior art (AAPA) and Yoshihara (US 6,155,016) as applied to Claims 1-7 and 9-20 above, and further in view of Hunter (US 5,724,062).

Regarding **Claims 21 ~~and 22~~**, Uehara in view of the AAPA and Yoshihara, fails to teach that the light source comprises at least four light emitting diodes having four different light emission wavelengths. Hunter teaches an LCD display device using red green blue and yellow light emitting diodes as backlights (Hunter, Figs. 3-5). It would have been obvious to one of ordinary skill in the art at the time of the invention to include four colors as taught by Hunter, instead of three as taught by Uehara in view of the AAPA and Yoshihara in order to be more suitable for certain applications creating accurate yellows are important (Hunter, Col. 4 lines 36-51).

Regarding **Claims 22**, Hunter further teaches that the light source comprises at least one blue light emitting diode, at least one green light emitting diode, at least one red light emitting diode, and at least one amber light emitting diode (Hunter, Fig. 3 RGBY, yellow is equivalent to amber).

Response to Arguments

Applicant's arguments with respect to Claims 1-4, 6, 7 and 9-22 have been considered but are moot in view of the new ground(s) of rejection.

Regarding Claim 5, the applicant argues that Uehara fails to teach that the color filters and the maximum emission wavelength are within 5nm of each other for the

respective colors. The examiner respectfully disagrees. Uehara clearly teaches red, green and blue light sources matched to red, green and blue color filters, additionally Uehara also teaches that the ratios of transmissivities of red, green and blue color filters can match the light emitting efficiencies of the light emitting elements on a 1:1 ratio which is essentially a perfect match of the colors (Uehara, Co. 2 lines 37-64).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ke Xiao whose telephone number is (571) 272-7776.

The examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

November 28, 2007 - kx -

SUMATI LEFKOWITZ
SUPERVISORY PATENT EXAMINER